Spring and autumn spawning herring in the Gulf of Riga: intraspecific biodiversity across small local scales

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Spring and autumn spawning herring in the Gulf of Riga: intraspecific biodiversity across small local scales

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Herring has been one of the most important commercial fish species in the Baltic Sea for centuries. Based on spawning time (spring versus autumn), location of spawning grounds, larval ecology, growth rate and age of maturation, two distinct ecotypes have been described. Currently, spring spawning herring is strongly dominating in commercial catches and contributions from autumn spawning herring are almost negligible. Autumn spawning herring strongly dominated herring catches in the Baltic Sea historically, reaching up to 90% of catches a century ago. However, whether autumn spawning herring constitutes a reproductively and genetically isolated spawning component is unknown. The aim of the present study was to assess levels of genetic divergence between spring and autumn spawning herring in the Gulf of Riga using two types of DNA markers (microsatellites and Single Nucleotide Polymorphisms). Results from temporally replicated analyses show clear genetic differences between the spawning types and hence support reproductive isolation. The results have clear practical implications by pointing to the need for management of these two distinct spawning components separately. Therefore, the management scheme of herring in the area needs likely to be changed to manage exploited herring stocks sustainably, and specifically to allow rebuilding of autumn spawning herring.